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EX PARTE OR LATE FILED

March 18, 1997

Mr. William F. Caton
Secretary
Federal Communications Commission
1919 M Street, NW Room 222
Washington, D.C. 20554

EX PARTE: Federal-State Joint Board on Universal Service (CC Docket No. 96-45)

Dear Mr. Caton:

Late Friday, March 14, Professor Paul Milgrom of Stanford University sent the attached electronic message regarding the design of an auction for universal service support in the captioned docket to Elliot Maxwell, Greg Rosston, Evan Kwerel, Bill Sharkey, and Pat Degraba. In accordance with Section 1.1206(a)(1) of the Commission's Rules, an original and two copies of this notice are being filed with the Secretary of the FCC.

Please let me know if you have any questions.

Sincerely,

Charon J. Harris

Attachment
cc: P. Degraba
E. Kwerel
G. Rosston
E. Maxwell
W. Sharkey

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Barry and Jeremy:

Thanks for your comments and the description of your proposal.

I am trying to understand how your proposal might work and also what the basis might be of some of your criticism. So, I will ask some questions and also make a claim about the comparative performance of the auctions we've proposed. My hope is that this will enable the discussion next week to proceed further than it otherwise might.

1. My first questions concern how you envision the pricing and supply of premium (non-basic) services and what forms you expect local service competition to take. In the GTE proposal, all subscribers in a high-cost area would qualify for the subsidy even if they purchase non-basic services. Obviously, if the subsidy is paid only for subscribers who purchase only the basic service, there will be a price distortion that discourages the purchase of enhanced services by consumers in the area.

Does your carrier of last resort proposal envision that only consumers who purchase just basic services go into the high cost pool? If not, how do we know that the carriers of last resort even offer the more extensive services that the consumer might wish to purchase?

If high cost subsidies are paid only for basic services and subscribers are assigned at random, how do consumers benefit from the multiplicity of COLRs? After all, both the service definition and price are both fixed by regulation, and consumers have no option to choose on the basis of quality. Also, without consumer choice, don't you have a continuing need for quality of service regulation?

2. My next questions concern geographic scope. You claim that it would be possible to use "larger areas" in your scheme. My question concerns how much larger you think the areas could be. One kind of competition suggested by maps of wire center locations is between wireline carriers for service of areas reachable from the alternative wire centers.

How could a LEC compete for areas near the boundaries of its existing service areas if it were forced to offer service to a random selection of customers in a "larger" area? What incentive would the ILEC have to swap customers with the entrant on reasonable terms if the ILEC alone has the ability to serve customers in the whole area?

3. Regarding the economies of density concern, this has become an increasing concern in my view, too, but I don't think the diagnosis of the problem is yet complete. We need to consider whether the economies of density in

wireline competition would be solved by sharing distribution facilities (but not feeders, switches, etc). We also need to evaluate what rules would make sense if there are economies of density for wireline service but not for wireless. I am hoping to learn more about the costs of wireless service before rendering my own opinion on this issue.

4. Finally, I have a comment on one of your criticisms of the GTE proposal. You have attributed the criticism to "Dan Vincent and others." I haven't seen any such comments from Dan or anyone and, in any case, the criticism is mistaken.

Here is what you wrote:

>2. GTE proposes that if the top two bids are acceptably close, that two COLRs
>be designated for an area (and if the top three bids are acceptably close then
>three COLRs be designated). As recognized by Dan Vincent and others, one
>problem with this mechanism is that the incentive to bid aggressively is
>dramatically reduced, because of the likelihood that the second or third place
>bid would get a share of the market. There would be an incentive on one side
>to make the lowest bid you could to get a piece of the market.

This criticism does apply to the Bulow-Nalebuff auction proposal, but not to the GTE proposal. Here is your proposal, in your words:

>In the auction, firms that wish to be a COLR submit a fixed-fee sealed bid to
>take 100% of the COLR business in the designated area. The firm with the
>lowest bid would be designated the Primary COLR. It would be assigned some
>fraction of the COLR pool (and receive the corresponding fraction of its bid.
>
>The firm with the second best bid would have the option of being designated
>the secondary COLR. It would take 25% of the COLR pool business on the same
>terms as the winner, pro rata. If the second firm declined, the third highest
>bidder would be given this option, and so on. The firm that got 25% of the
>business would be the Secondary COLR. If none of the other bidders took on
>this business, then the winning bidder would be given 100% of the COLR
>business and it would be paid 100% of its bid.
>
To see how our the predicted subsidy levels of the two proposals compare, let's look at an example. Suppose there are two potential COLRs in an area, perhaps the ILEC and a wireless entrant. To keep the arithmetic simple, let's normalize their costs of service to be zero and let's suppose the reserve price in the auction is 12.

In your proposal, either bidder could bid the reserve of 12 per customer and still be assured of 25% of the customers and earn profits of 3. Among the

implications of this are: (1) it is a dominated strategy for any bidder to bid less than 4, since such a bid never earns as much as 3, and (2) the total expected subsidies paid to the bidders in any Nash equilibrium must be at least 6.

In the GTE proposal, the acceptable margin between the bids is a critical determinant of the intensity of the competition. If the acceptable margin is zero, there is just one winner and competition in the situation described drives the subsidy to zero. If the acceptable margin is 1, so that there are two winners only if the margin between the bids is one or less, then I'd make the following analysis.

First, at any pure strategy Nash equilibrium, the bids are 1 and 2, so two firms serve the market at a price of 2.

As you guys know (here I'm writing for our wider audience), the solution concept of Nash equilibrium is vulnerable to criticism in this application, because it involves the strong assumption that bidders can correctly guess one another's strategies. There are other solution concepts which make the lesser assumption that it is common knowledge among the bidders that they are rational in the pursuit of their own interests.

With that sort of idea in mind, let's do a technical analysis. Let's identify the highest bid x such that if the bidders all restrict their bids to x or less, the bid of x is not weakly dominated in the restricted game. It is not hard to show that if $x>4$, then (in the restricted game) a bid of x is weakly dominated by a bid of $x-2$. Thus, if the bidders' rationality is common knowledge, no bidder would ever bid more than 4 and the bidders' total profits could not be more than 4.

Up to this point, the zero cost in the analysis was just to simplify the arithmetic; the zero played no fundamental role. Let us now suppose that the cost really is zero and let's consider the "zeroing the subsidy" option in the GTE proposal. For simplicity of the arithmetic, I consider a version where the low bidder subsidy continues indefinitely. In that case, making the same analysis, a rational bidder would never bid more than 2, since any higher bid is weakly dominated by a bid of zero.

With or without the zeroing the subsidy proposal, the GTE proposal in this numerical example yields lower support payments than your proposal.

Paul Milgrom